REMARKS

The Non-Final Office Action mailed February 4, 2009 and the references cited therein have been carefully considered. Claims 1-26 are now pending in the application, of which Claims 22 and 24-26 have been withdrawn from consideration. No claim amendments are presented by this Response. Applicants respond to the issue raised in the subject Office Action more specifically below and respectfully requests reconsideration of the pending rejections.

Claim Rejections under 35 USC § 102

Claims 1-10, 12, 13, 15-19, 21 and 23 are rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Published Patent Application No. 2001/0043396 to **Lee**. Applicants respectfully traverse this rejection as set forth more fully below.

Lee describes a diffractive device having a surface relief structure. When illuminated by a light source, the relief structure generates one or more diffraction images which are observable from particular ranges of viewing angles around the device (see, Lee Claim 1). The surface relief structure includes a) background diffractive structural elements, and b) interstitial diffractive structural elements. The interstitial elements are interspersed between the background elements in differing configurations. One possible configuration is shown in Figure 1 of Lee where the interstitial elements 2 extend in grooves between ridges of two background elements 1 running parallel to each other. Fig. 11d of Lee shows another configuration where exclusive areas 35 of interstitial elements alternate with exclusive areas 28 of background elements 1.

Thus, the core teaching in Lee is that the diffractive action of the background elements is modulated by the interstitial elements (as particularly noted in claim 1 of Lee). It is the interstitial elements that are responsible for the optical effect generated by the relief structure (see, Lee paragraphs [0039] to [0046]).

In contrast, the optical security element of the present patent application makes use of completely different optical effects. The Lee disclosure describes creating a multi-channel diffraction image, by interleaving different pieces of diffractive image information that are then observable from particular ranges of viewing angles. The present invention uses concealed information in a diffraction image and renders it visible only by means of a corresponding verification element. The purpose of the modulations described by Lee are to ensure that the transitions between the interstitial elements and the background elements are not seen; whereas the purpose of the modulations described in the present patent application are so that the variations are seen, with an appropriate verification tool.

More notably, Lee fails to teach all the elements of the claimed invention. In particular, Lee does not disclose a diffraction grating "wherein one or more of the relief parameters defining the relief structure in the surface region are varied periodically in accordance with a periodic parameter variation function." The Examiner's attention is directed to Figure 6a of the instant patent application, in comparison to Figure 5 of Lee. The instant Figure 6a shows a relief structure 61 with a constant spatial frequency 1/period 62, whereby the profile depth of the relief structure 61 is varied by a periodic parameter variation function with a period 63. The basic

form (F) of a period 62 (e.g., $F = t * \sin(P_1)$) defined by means of the relief parameters relief

shape (sine), spatial frequency (1/period 62), azimuth angle and relief depth (t) is varied by

variation of the parameter relief depth (t) by means of a sine-shaped parameter variation function

($t = k + 1 * \sin(P_2)$) of a period 63, so that the relief shape shown in Fig. 6a is finally produced.

The parameter variation function is <u>not the function</u> that describes the basic shape of the

diffraction grating but a function which varies one or more <u>parameters</u> of this basic shape (i.e.,

the relief depth). It is the relief <u>parameter</u> relief depth defining the diffraction grating which is

varied by means of the parameter variation function. In this way, a parameter (p) of a function

(F(p)) is varied, which defines the diffraction grating and not directly the function result z, i.e.

the local embossing depth: $z = F(p)$. Accordingly, Lee fails to teach or reasonably suggest all the

elements of the claimed invention.

Moreover, Lee describes that it is particularly advantageous if the interstitial element

ridge or groove segments are approximately parallel to ridge or groove segments in adjacent

background elements (see, Lee Claim 2). Also, Lee describes that it is particularly advantageous

if interstitial elements are connected smoothly at each end to a background element (see, Lee

Claim 4). Thus, using the teachings of Lee one of ordinary skill in the art would refrain from a

phase displacement between interstitial elements and background elements. A phase

displacement of adjacent structural elements would contradict Lee's underlying concept of

parallelism and smooth continuity. One of ordinary skill would therefore not be guided by Lee

to the feature of the present invention that the one or more of relief parameters defining the relief

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structure, relief shape, relief depth, spatial frequency and azimuth angle in the one or more

pattern regions are varied in accordance with their parameter variation function which is phase-

displaced with respect to the parameter variation function of the background region.

In paragraphs [0011] to [0013] of Lee it is specified as a disadvantage of known

diffractive elements (Kinegram™, Pixelgram™, Exelgram™) that by means of inevitable

discontinuities between adjacent pixel gratings (Kinegram™, Pixelgram™) and at the interface

between tracks (Exelgram™) extraneous diffuse scattering effects are created. Lee teaches a

diffractive device that avoids these disadvantages. According to Lee, extraneous diffuse

scattering effects are minimised by a <u>continuous connectivity</u> throughout the entire structure

(paragraph [0072]). The background structural element pattern is <u>continuous</u> in both directions

(paragraph [0074]), and the interstitial structural elements join <u>smoothly</u> into the background

structural elements (paragraphs [0020] to [0033]). It should be noted that these three expressions

"connected", "continuous" and "smoothly" are the central theme of the Lee disclosure.

Thus, providing a phase displacement between interstitial structural elements and

background structural elements, i.e. an abrupt discontinuity, is contrary to the teaching of Lee.

Accordingly, Lee fails to disclose that "one or more of the relief parameters defining the relief

structure, relief shape, relief depth, spatial frequency and azimuth angle in the one or more

pattern regions are varied in a accordance with the parameter variation function which is <u>phase-

displaced</u> with respect to the parameter variation function of the background region" (emphasis

added) as further recited in Claim 1 of the present application.

Accordingly, Lee fails to teach or reasonably disclose all the elements of the claimed

invention. Thus, Applicants respectfully request reconsideration and withdrawal of the rejection

of Claims 1-10, 12, 13, 15-19, 21 and 23 under 35 U.S.C. §102(b) based on Lee.

Claim Rejections under 35 USC § 103

Claims 11, 14 and 20 are rejected under 35 U.S.C. §103(a) as being unpatentable over

Lee in view of U.S. Patent No. 6,157,487 to **Staub**. The Office Action proposes that Lee

discloses all of the elements of the rejected claims with the exception of the claimed line density.

Thus, Staub is recited for teaching such ranges. Applicants respectfully traverse this rejection as

set forth more fully below.

Initially as noted above, contrary to the contention of the subject Office Action, Lee does

not teach or reasonably disclose all the elements of the claims, outside the claimed line density

which is purportedly taught by Staub. Also, although Staub discloses more specific line

densities, the Staub patent fails to teach or reasonably disclose the further elements of the

claimed invention not disclosed by Lee, as addressed above with regard to the §102 rejection.

Consequently, a person of ordinary skill in the art taking into account and possibly altering the

teachings of Lee with Staub would not arrive at the present invention as recited in the claims, and

particularly dependent Claims 11, 14 and 20.

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Accordingly, Applicants hereby respectfully request reconsideration and withdrawal of

the current rejections of the claims under 35 U.S.C. §103(a) as being unpatentable over Lee in

view of Staub.

Conclusion

Applicants submit that the claims, particularly independent claim 1, are clearly

distinguishable from the cited prior art references. Also, claims 2-21 and 23, which ultimately

depend from Claim 1, are similarly patentable over the art of record by virtue of their

dependence. Also, Applicants submit that Claims 2-21 and 23 define patentable subject matter

in their own right. In view of the foregoing remarks, Applicants respectfully request

reconsideration and allowance of the claims presented.

If the Examiner has any questions or suggestions to expedite allowance of this

application, she is cordially invited to contact Applicants' attorney at the telephone number

provided.

Respectfully submitted,

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